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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/562,136	LI, GANG	
	Examiner	Art Unit	
	Alexis Boateng	2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 - 3, 7-9, 12 – 15, and 17 – 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. 2003/0209375) in view of Guimarin (U.S. 5,612,606) and in further view of Hammerslag (U.S. 5,927,938).

Regarding claims 1 and 25, Suzuki discloses an electric public transit system, comprising:

an electric driven bus (figure 1A item 1) equipped with a cassette battery (figure 1A item 2) set and a bus mounted control system (figure 6; paragraph [0064])

a charge station placed in a predetermined place for charging cassette battery sets (figure 1A item 3); and

a loading and unloading apparatus (figure 1A item 16);

wherein when the bus needs change the cassette battery set, the loading and unloading apparatus unloads the cassette battery set from the bus and loads a charged cassette battery set into the bus (figure 9 item 16; paragraph [0104]);

the charge station and the loading and unloading apparatus are equipped with their control systems respectively (figure 5 items 51, and 52 respectively: paragraph [0061]).

Suzuki does not disclose the loading and unloading control system, the bus-mounted control system and the charge control system are able to intercommunicate; nor whereby when the loading and unloading control system receives a signal sent from the bus-mounted control system of the bus that the bus will return to the charge station, the loading and unloading apparatus moves to a predetermined position corresponding to the bus at the charge station and waits; and when the bus arrives at the predetermined position, the loading and unloading apparatus exchanges cassette battery sets, whereby the bus is able to operate on line continuously.

Guimarin discloses in column 12 lines 57 – column 13 line 29 wherein the loading and unloading control system, the bus-mounted control system and the charge control system are able to intercommunicate.

Hammerslag discloses whereby when the loading and unloading control system receives a signal sent from the bus-mounted control system of the bus that the bus will return to the charge station, the loading and unloading apparatus moves to a predetermined position corresponding to the bus at the charge station and waits (column 6 lines 27 – 57: battery and charging information is provided to the centralized database, including location of battery and charge status of battery while in vehicle.); and when the bus arrives at the predetermined position,

the loading and unloading apparatus exchanges cassette battery sets, whereby the bus is able to operate on line continuously (column 7 lines 56 - column 8 line 7).

Hammerslag discloses the claimed invention except for whereby the signal is sent from the bus mounted control system. The signals are read from the battery which is in the vehicle, so it would have been obvious to display this information in the vehicle to the user, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In Re Japikse* , 86 USPQ 70.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin and Hammerslag reference so that the user is more informed of the vehicle's battery status.

Regarding claim 2, Suzuki discloses the electric public transit system of claim 1, wherein the bus-mounted control system includes at least one PLC programmable logic controller (figure 6 item 8).

Suzuki does not disclose wherein after the loading and unloading apparatus completes exchanging cassette battery sets, the bus-mounted control system controls to lock the cassette battery set and complete whole electrical connection within the bus; the bus has a special chassis equipped with a hanger flame for holding the cassette battery set, the hanger frame is equipped with rollers capable of engaging with the cassette battery set and electrical connection

means for implementing electrical connection with the cassette battery set; the hanger flame is further equipped with at least two locking means; each of the locking means includes a motor, a reduction gear, and a screw rod press means driven by the reduction gear; and whereby when the cassette battery set is inserted into a cavity of the hanger frame on the special chassis and positioned, the locking means are controlled by the bus-mounted control system to lock the cassette battery set on the hanger flame so as to ensure security of the bus during operating.

Hammerslag discloses after the loading and unloading apparatus completes exchanging cassette battery sets, the bus-mounted control system controls to lock the cassette battery set and complete whole electrical connection within the bus (column 7 lines 56 – column 8 line 6).

Guimarin discloses the bus has a special chassis equipped with a hanger frame for holding the cassette battery set, the hanger frame is equipped with rollers capable of engaging with the cassette battery set and electrical connection means for implementing electrical connection with the cassette battery set (column 7 lines 23 – 63: cradle arm is a hanger frame for holding the cassette battery set; Rollers item 33 are disposed within the cradle arm);

the hanger flame is further equipped with at least two locking means (column 7 lines 23 – 63; figure 5 item 37);

each of the locking means includes a motor, a reduction gear, and a screw rod press means driven by the reduction gear (column 6 line 42 – column 7 line 22); and

whereby when the cassette battery set is inserted into a cavity of the hanger frame on the special chassis and positioned, the locking means are controlled by the bus-mounted control system to lock the cassette battery set on the hanger flame so as to ensure security of the bus during operating (column 7 lines 27 – column 8 line 16).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin and Hammerslag references so that battery is securely connected within the vehicle.

Regarding claim 3, Suzuki discloses wherein the electric public transit system of claim 1, wherein the bus-mounted control system includes at least one PLC programmable logic controller (figure 6 item 8).

Suzuki does not disclose the bus has a flame of a truss type structure, the truss type structure is formed with a whole skeleton, and a whole integral body is formed, and a hanger flame is positioned on a chassis of the frame for containing the cassette battery set, and equipped on both sides of the frame of the hanger frame with rollers, locking means, positioning means, and joint means for engaging with the loading and unloading apparatus.

Guimarin discloses the bus has a flame of a truss type structure, the truss type structure is formed with a whole skeleton, and a whole integral

body is formed (column 7 line 27 – column 8 line 16), and a hanger flame is positioned on a chassis of the frame for containing the cassette battery set, and equipped on both sides of the frame of the hanger frame with rollers, locking means, positioning means, and joint means for engaging with the loading and unloading apparatus (column 7 lines 27 - column 8 line 16).

Regarding claim 4, Suzuki discloses wherein the electric public transit system of any one of claims 1 to 3,

wherein the bus is further equipped with an auxiliary start means;

the auxiliary start means includes capacitors and an auxiliary motor, high power ratio charging and discharging characteristic of the capacitors is utilized for storing energy produced during electric braking for a use by the auxiliary motor, and the bus-mounted control system determines whether a current speed of the bus is zero or not, if the speed is accelerating from zero, the auxiliary motor is started to aid a main motor of the bus for starting the bus with a reduced starting current.

Regarding claim 5, The electric public transit system of any one of claims 1 to 3, wherein the bus is further equipped with a two-grade braking means;

whereby when a driver steps on a brake pedal lightly, a main motor of the bus is changed to a generator for changing inertia kinetic energy of the bus into electrical energy, which is charged into a bus-mounted capacitor for storing by a charging controller in an electric braking system; and

when the driver steps on the brake pedal deeper, a pneumatic brake system is started for braking the bus, the pneumatic brake system includes a motor, an air pump and a gas container.

Regarding claim 6 The electric public transit system of claim 4, wherein the bus is further equipped with a two-grade braking means;
whereby when a driver steps on a brake pedal lightly, a main motor of the bus is changed to a generator for changing inertia kinetic energy of the bus into electrical energy, which is charged into a bus-mounted capacitor for storing by a charging controller in an electric braking system; and when the driver steps on the brake pedal deeper, a pneumatic brake system is started for braking the bus, the pneumatic brake system includes a motor, an air pump and a gas container.

Regarding claim 7, Suzuki discloses the electric public transit system of any one of claims 1 to 3 and 6, wherein the cassette battery set includes a housing for containing battery units, a plurality of groups of battery units connected together by wires within the housing, and sockets placed on the housing (figure 1 item 3);

the plurality of groups of battery units are spaced by partitions (figure 8A item 12), each group of battery units comprises a plurality of battery units, the battery units and groups of battery units are electrically connected by wires to rods of the sockets (figure 8 item 13).

Suzuki does not disclose the housing of the cassette battery set is further equipped with positioning means, locking means and openable covers, the positioning means and locking means are used for positioning and locking the

housing on the bus respectively and adopt pin-hole connections, and the openable covers are mounted above openings of cavities of the sockets.

Guimarin discloses wherein the housing of the cassette battery set is further equipped with positioning means, locking means and openable covers, the positioning means and locking means are used for positioning and locking the housing on the bus respectively and adopt pin-hole connections, and the openable covers are mounted above openings of cavities of the sockets (column 10 lines 5lines 17 – 43: positioning guides lock into the car when transferring batteries).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin reference so that the battery system is secure while transporting the batteries.

Regarding claim 8, Suzuki discloses the electric public transit system of any one of claims 1-3, 6, wherein the bus changes the cassette battery set when the discharge depth of the cassette battery set is about 60% to 80% (paragraph [0072]: internal resistance measurement is directly related to discharge).

Regarding claim 9, Suzuki discloses the electric public transit system of claim 8, wherein the bus changes the cassette battery set when the discharge depth of the cassette battery set is up to about 70% (paragraph [0072]).

Suzuki discloses the claim as disclosed, but does not disclose where the charge depth is about 70%. It would have been obvious to a person of ordinary skill in the art to modify the discharge value to be 70% to accommodate a range

of batteries, since it has been held that there where the general conditions of a claim are disclosed in the prior art, discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Bosch,* 617 F.2d 272, 205 USPQ (CCPA 1980).

Regarding claim 12, Suzuki discloses the electric public transit system of claim 10, wherein the charging shelf is further equipped with a sampling means, capacity displayer for showing capacity of the cassette battery set, and a temperature measure and control means (paragraph [0068] – [0069], [0135]);

Guimarin discloses the temperature measure and control means can adjust temperature within the charging shelf based on predetermined battery category and model (column 5 lines 26 - 41); and

the charging shelf further includes a plurality of layers of cavities for containing cassette battery sets, the charging shelf is further equipped with electrical connection means for electrically connecting with cassette battery sets, guiding wheel means, and joint means for jointing with the loading and unloading apparatus (figure 1A item 12).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin reference so that the batteries are not overheated during charging.

Regarding claim 13, Suzuki discloses the electric public transit system of claim 10 or 12, wherein the charge station further comprises a plurality of charging shelves (figure 8A item 12). Suzuki does not disclose a plurality of loading and

unloading apparatus for implementing loading, unloading and charging cassette battery sets for a plurality of buses simultaneously.

Guimarin discloses a plurality of loading and unloading apparatus for implementing loading, unloading and charging cassette battery sets for a plurality of buses simultaneously (figure 1 items 72).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki system with the Guimarin system so that the exchange system may be conducted faster.

Regarding claim 14, Suzuki discloses the electric public transit system of claim 2 or 12, but does not disclose wherein the electrical connection means is a crocodile clamp contact means, which includes a camshaft clamp means for smoothly moving a cassette battery set into or out of a cavity for containing the cassette battery set in the bus, when the cassette battery set is positioned and locked by the locking means, the camshaft clamp means operates to implement electrical connection.

Guimarin discloses wherein the electrical connection means is a crocodile clamp contact means, which includes a camshaft clamp means for smoothly moving a cassette battery set into or out of a cavity for containing the cassette battery set in the bus, when the cassette battery set is positioned and locked by the locking means, the camshaft clamp means operates to implement electrical connection (figure 12 item 162, hooks are clamps to bring the batteries to the vehicles).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin reference so that the battery transition maybe secure.

Regarding claim 15, Suzuki discloses the electric public transit system of claim 14, but does not disclose wherein the crocodile clamp contact means includes a stator, an actor and a support shaft made of conductive metal material, a camshaft with cams made of insulating material, and a driving motor; after the cassette battery set is inserted into the cavity for the cassette battery set in the bus and accurately positioned, the bus-mounted control system sends a signal to control the camshaft driven by the driving motor to make the stator and the actor of the crocodile clamp contact means tightly clamp a rod; and when the cassette battery set needs change, the bus-mounted control system sends instruction to relax the crocodile clamp contact means, and then the actor is open for implementing no resistant plug-in and out of a high-tension contact section and ensuring smoothly inserting into or pulling out the cassette battery set.

Guimarin discloses wherein the crocodile clamp contact means includes a stator, an actor and a support shaft made of conductive metal material, a camshaft with cams made of insulating material, and a driving motor (column 9 lines 13 – 35; column 14 lines 18 – 62);

after the cassette battery set is inserted into the cavity for the cassette battery set in the bus and accurately positioned, the bus-mounted control system sends a signal to control the camshaft driven by the driving motor to make the

stator and the actor of the crocodile clamp contact means tightly clamp a rod (column 14 lines 1 – 62) ; and when the cassette battery set needs change, the bus-mounted control system sends instruction to relax the crocodile clamp contact means, and then the actor is open for implementing no resistant plug-in and out of a high-tension contact section and ensuring smoothly inserting into or pulling out the cassette battery set (column 14 lines 18 – 62).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin system so that the batteries may easily placed in the vehicles.

Regarding claim 17, Suzuki discloses the electric public transit system of any one of claims 1-3, 10, and 15, wherein the loading and unloading control system includes at least one PLC programmable logic controller for controlling the loading and unloading apparatus to perform exchanging of cassette battery sets (paragraph [0064] – [0069].

Guimarin discloses the loading and unloading apparatus is of a mechanical arm structure, including a moving platform, a tray, a lift means, moving tracks of the moving platform, and wheels (figure 10 item 74);

the lift means can lift the tray in a direction vertical to a top plane of the moving platform, and the track wheels are mounted on the bottom of the moving platform (column 9 lines 20 – 51).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin system so that the batteries may easily placed in the vehicles.

Regarding claim 18, Suzuki disclose the electric public transit system of claim 17, but does not disclose wherein the mechanical arms further includes a rotating platform, a rotating mechanism and a driving means for driving the rotating platform; and the rotating platform is placed on the moving platform, and can rotate to 90 degree or 180 degree on the moving platform so as to insert a charged cassette battery set into the bus, and/or deliver a used or broken cassette battery set to the charging shelf or a repair platform in the charge station.

Guimarin discloses wherein the mechanical arms further includes a rotating platform, a rotating mechanism and a driving means for driving the rotating platform; and the rotating platform is placed on the moving platform, and can rotate to 90 degree or 180 degree on the moving platform so as to insert a charged cassette battery set into the bus, and/or deliver a used or broken cassette battery set to the charging shelf or a repair platform in the charge station (column 6 lines 42 - column 7 lines 22).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin system so that the batteries may easily placed in the vehicles.

Regarding claim 19, Suzuki discloses the electric public transit system of claim 17, but does not disclose wherein the lift means further includes a lifting system comprising two sets of lifting arms and driving means;

the mechanical arms and the charging shelf both are placed under ground of the charge station; while the bus is returning the charge station, one set of the lifting arms takes out a charged cassette battery set corresponding to the bus in advance, and moves to the predetermined position corresponding to the bus and waits; when the bus stops at the predetermined position, the other set of the lifting arms takes the used cassette battery set from the bus and moves down to a layer on the charging shelf corresponding to the cassette battery set, and the one set of the lifting arms with the charged cassette battery set in arms moves close to the cavity for cassette battery set in the bus and push the charged cassette battery set in; and the other set of the lifting arms with the used cassette battery set puts the used cassette battery set into the corresponding layer.

Guimarin wherein the lift means further includes a lifting system comprising two sets of lifting arms and driving means (figure 7 items 109);

the mechanical arms and the charging shelf both are placed under ground of the charge station (figure 7 item 74);

while the bus is returning the charge station, one set of the lifting arms takes out a charged cassette battery set corresponding to the bus in advance, and moves to the predetermined position corresponding to the bus and waits (column 9 lines 20 - 51);

when the bus stops at the predetermined position, the other set of the lifting arms takes the used cassette battery set from the bus and moves down to a layer on the charging shelf corresponding to the cassette battery set, and the one set of the lifting arms with the charged cassette battery set in arms moves close to the cavity for cassette battery set in the bus and push the charged cassette battery set in (column 9 lines 20 – 51; column 10 lines 17 - 51); and

the other set of the lifting arms with the used cassette battery set puts the used cassette battery set into the corresponding layer (column 10 lines 17 – 51).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin system so that the batteries may easily placed in the vehicles.

Regarding claim 20, Suzuki discloses the electric public transit system of claim 18 or 19, but does not disclose wherein the mechanical arms further include sensors for detecting positions of the bus and the charged cassette battery sets to be taken from the charging shelf and sensors are placed on different positions on the mechanical arms in a lifting vertical direction and the charging shelf correspondingly, in order to position freely the tray to any layer of the charging shelf in the vertical direction.

Guimarin discloses wherein the mechanical arms further include sensors for detecting positions of the bus and the charged cassette battery sets to be taken from the charging shelf (column 11 lines 65 – 26); and

sensors are placed on different positions on the mechanical arms in a lifting vertical direction and the charging shelf correspondingly, in order to position freely the tray to any layer of the charging shelf in the vertical direction (column 11 lines 51 - 65).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin system so that the batteries may easily placed in the vehicles.

Regarding claim 21, Suzuki discloses the electric public transit system of any one of claims 1-3, 9, 10, 15, 18 and 19, wherein the electric public transit system further includes a control center; and the control center comprises a PC and/or at least one PLC programmable logic controller (paragraphs [0060] - [0061]);

the control center is placed in the charge station and can intercommunicate with the charge control system (paragraph [0163]).

Regarding claim 22, Suzuki discloses wherein the electric public transit system of claim 21, wherein the charge control system and the control center can share same programmable logic controller (paragraph [0060] – [0061]).

Regarding claim 23, Suzuki the electric public transit system of one of claims 1-3, 9, 15, 18, 19 and 22, but does not disclose wherein the electric public transit system further includes a dispatch and rescue service system; the dispatch and rescue service system has at least one urgent service vehicle; the dispatch and rescue service vehicle is equipped with a bus-mounted battery carrier and a battery passage; the battery carrier has a spare charged cassette battery set; the

battery passage has a cavity, joint arms and driving means, the battery passage is used for taking a broken cassette battery set from and inserting a spare cassette battery set into the bus; and the joint arms and the driving means are used for jointing the battery passage with an opposite position for the housing of the cassette battery set on the chassis of the bus.

Guimarin discloses wherein the electric public transit system further includes a dispatch and rescue service system; the dispatch and rescue service system has at least one urgent service vehicle; the dispatch and rescue service vehicle is equipped with a bus-mounted battery carrier and a battery passage; the battery carrier has a spare charged cassette battery set; the battery passage has a cavity, joint arms and driving means, the battery passage is used for taking a broken cassette battery set from and inserting a spare cassette battery set into the bus; and the joint arms and the driving means are used for jointing the battery passage with an opposite position for the housing of the cassette battery set on the chassis of the bus (column 5 lines 19 - 51).

Guimarin discloses the system as claimed, but does not disclose the dispatch and rescue service and vehicle. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed structural limitations. *Ex parte Masham* 2 USPQ2d 167. In this case, vehicles are provided which may be a dispatch and rescue.

Regarding claim 24, Suzuki discloses the electric public transit system of one of claims 1-3, 9, 10, 15, 19 and 22, but does not disclose wherein the electric public transit system further includes a urgent loading and unloading apparatus comprising a scissor lifting mechanism, a hydraulic driving means, a tray for cassette battery set, main wheels driven by a power means, auxiliary wheels steered by manual, and a handle; the tray for cassette battery set is further equipped with a joint means and a moving means; and the moving means is a fork driven by a chain, which can move the cassette battery set from a cavity for cassette battery set in the bus to the tray of the mechanical arms, or deliver the cassette battery set into the cavity for cassette battery set in the bus.

Guimarin wherein the electric public transit system further includes a urgent loading and unloading apparatus comprising a scissor lifting mechanism, a hydraulic driving means, a tray for cassette battery set, main wheels driven by a power means, auxiliary wheels steered by manual, and a handle; the tray for cassette battery set is further equipped with a joint means and a moving means; and the moving means is a fork driven by a chain, which can move the cassette battery set from a cavity for cassette battery set in the bus to the tray of the mechanical arms, or deliver the cassette battery set into the cavity for cassette battery set in the bus (column 6 lines 41 - column 7 lines 64).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin reference so that the batteries may be securely and safely placed in the vehicle.

Regarding claim 26, Suzuki discloses the method of claim 25, but does not disclose wherein when the bus-mounted control system detects a battery unit or a group of battery units in the cassette battery set being unable to work, the bus-mounted control system sends a warning signal to the driver of the bus; if the rest of battery units in the cassette battery set has enough capacity to support the bus to return the charge station, the bus is driven back to the charge station, otherwise an rescue signal is sent out; after receiving the returning signal from the bus, the charger station sends instruction to wait for exchanging the failed cassette battery set; and the loading and unloading apparatus moves to the front of the charging shelf having a charged cassette battery set to be taken and waits for the bus, and a repair procedure of the repair system for cassette battery set is started, then the failed cassette battery set taken by the loading and unloading apparatus is delivered to the repair stage at the charger station for testing and repairing

Guimarin discloses wherein when the bus-mounted control system detects a battery unit or a group of battery units in the cassette battery set being unable to work, the bus-mounted control system sends a warning signal to the driver of the bus; if the rest of battery units in the cassette battery set has enough capacity to support the bus to return the charge station, the bus is driven back to the charge station, otherwise an rescue signal is sent out; after receiving the returning signal from the bus, the charger station sends instruction to wait for exchanging the failed cassette battery set; and the loading and unloading

apparatus moves to the front of the charging shelf having a charged cassette battery set to be taken and waits for the bus, and a repair procedure of the repair system for cassette battery set is started, then the failed cassette battery set taken by the loading and unloading apparatus is delivered to the repair stage at the charger station for testing and repairing (column 5 lines 19 – 51).

Guimarin discloses the system as claimed, but does not disclose the dispatch and rescue service and vehicle. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed structural limitations. *Ex parte Masham* 2 USPQ2d 167. In this case, vehicles are provided which may be a dispatch and rescue.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki reference with the Guimarin reference so that the charging system may be safer for users with the warning system.

Regarding claim 27, Suzuki discloses wherein a method for charging the cassette battery sets of the electric transit system of claim 1, comprising turning on the power of a charger; reading data of the cassette battery set by the charge control system (paragraphs [0064]); determining whether a power grid used is in valleys or not by a power grid auto-trace apparatus, if yes, starting a full charge program in the charger controlled by the charge control system, and charging the cassette battery set with full current until the cassette battery set is fully charged,

if no, starting a float charge program in the charger controlled by the charge control system, and charging the cassette battery set with float current; charging the cassette battery set with float current when the cassette battery set is determined having been fully charged by the charge control system, whereby the cassette battery set is being charged at least with float current all the time except being used in the bus; and reading charging data of the cassette battery set and sending to the charge control system (paragraphs [0099] – [0100]; [0120]).

3. Claims 10, 11 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. 2003/0209375) in view of Guimarin (U.S. 5,612,606) and in further view of Hammerslag (U.S. 5,927,938) as applied to claim 1, and in further view of Nor (U.S. 5,594,318).

Regarding claims 10 and 11, Suzuki discloses the electric public transit system of claim 1, wherein the charge station further includes chargers, a charging shelf for containing cassette battery sets (figure 1A item 12).

Guimarin discloses a power grid auto-trace apparatus for searching electrical consumption valleys (column 5 lines 41 – 51: traces charging history of battery);

Nor disclose the chargers comprises a high-tension charger and a low-tension charger; the charge control system is a programmable logic controller (column 4 lines 19 - 39); and

Suzuki discloses the programmable logic controller, based on voltage data of power grid for each period scanned by the power grid auto-trace apparatus at

all period of time, controls the chargers to charge cassette battery set during electrical consumption valleys of power grid and to keep float charging to cassette battery set for the rest time (paragraph [0068] – [0069], [0120], [0135]: batteries are monitored during charging and then trickle charged, or float charged).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki in view of Guimarin and Hammerslag references with the Nor reference so that different charging is provided to prevent damage of the batteries.

Regarding claim 16, Suzuki discloses the electric public transit system of claim 15, but does not disclose wherein the crocodile clamp contact means includes a high-tension contact section and a low-tension contact section; the high-tension contact section is, after connected, for providing a high- tension power to a main motor of the bus; and the low-tension contact section is, after connected, for providing a low-tension power to other electric appliances needing low-tension power in the bus.

Guimarin wherein the crocodile clamp contact means (figure 12 item 162). Nor discloses includes a high-tension contact section and a low-tension contact section; the high-tension contact section is, after connected, for providing a high-tension power to a main motor of the bus; and the low-tension contact section is, after connected, for providing a low-tension power to other electric appliances needing low-tension power in the bus (column 4 lines 19 - 39; column 16 lines 7

– 17).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki in view of Guimarin and Hammerslag references with the Nor reference so that different charging is provided to prevent damage of the batteries.

4. Claims 4 – 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. 2003/0209375) in view of Guimarin (U.S. 5,612,606) and in further view of Hammerslag (U.S. 5,927,938) as applied to claim 1, and in further view of Parise (U.S. 2004/6142733).

Regarding claim 4, Suzuki in view of Guimarin and Hammerslag disclose the electric public transit system of any one of claims 1 to 3, wherein the bus is further equipped with an auxiliary start means; the auxiliary start means includes capacitors and an auxiliary motor, high power ratio charging and discharging characteristic of the capacitors is utilized for storing energy produced during electric braking for a use by the auxiliary motor, and the bus-mounted control system determines whether a current speed of the bus is zero or not, if the speed is accelerating from zero, the auxiliary motor is started to aid a main motor of the bus for starting the bus with a reduced starting current.

Parise discloses wherein the bus is further equipped with an auxiliary start means; the auxiliary start means includes capacitors and an auxiliary motor, high power ratio charging and discharging characteristic of the capacitors is utilized for storing energy produced during electric braking for a use by the auxiliary

motor, and the bus-mounted control system determines whether a current speed of the bus is zero or not, if the speed is accelerating from zero, the auxiliary motor is started to aid a main motor of the bus for starting the bus with a reduced starting current (paragraphs [0071], [0085] – [0087], [0094] – [0096]: capacitors are provided within system while moving, thus accelerating. Regenerative braking system provided).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki in view of Guimarin and Hammerslag system so that Parise system so that the charge within the vehicle may be easily conserved.

Regarding claim 5, Suzuki in view of Guimarin and Hammerslag disclose the electric public transit system of any one of claims 1 to 3, but does not disclose wherein the bus is further equipped with a two-grade braking means; whereby when a driver steps on a brake pedal lightly, a main motor of the bus is changed to a generator for changing inertia kinetic energy of the bus into electrical energy, which is charged into a bus-mounted capacitor for storing by a charging controller in an electric braking system; and when the driver steps on the brake pedal deeper, a pneumatic brake system is started for braking the bus, the pneumatic brake system includes a motor, an air pump and a gas container.

Parise discloses wherein the bus is further equipped with a two-grade braking means; whereby when a driver steps on a brake pedal lightly, a main motor of the bus is changed to a generator for changing inertia kinetic energy of

the bus into electrical energy, which is charged into a bus-mounted capacitor for storing by a charging controller in an electric braking system; and when the driver steps on the brake pedal deeper, a pneumatic brake system is started for braking the bus, the pneumatic brake system includes a motor, an air pump and a gas container (paragraphs [0071], [0085] – [0087], [0094] – [0096]: capacitors are provided within system while moving, thus accelerating. Regenerative braking system provided).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki in view of Guimarin and Hammerslag system so that Parise system so that the charge within the vehicle may be easily conserved.

Regarding claim 6, Suzuki in view of Guimarin and Hammerslag discloses the electric public transit system of claim 4, but does not disclose wherein the bus is further equipped with a two-grade braking means; whereby when a driver steps on a brake pedal lightly, a main motor of the bus is changed to a generator for changing inertia kinetic energy of the bus into electrical energy, which is charged into a bus-mounted capacitor for storing by a charging controller in an electric braking system; and when the driver steps on the brake pedal deeper, a pneumatic brake system is started for braking the bus, the pneumatic brake system includes a motor, an air pump and a gas container.

Parise discloses wherein the bus is further equipped with a two-grade braking means; whereby when a driver steps on a brake pedal lightly, a main

motor of the bus is changed to a generator for changing inertia kinetic energy of the bus into electrical energy, which is charged into a bus-mounted capacitor for storing by a charging controller in an electric braking system; and when the driver steps on the brake pedal deeper, a pneumatic brake system is started for braking the bus, the pneumatic brake system includes a motor, an air pump and a gas container (paragraphs [0071], [0085] – [0087], [0094] – [0096]: capacitors are provided within system while moving, thus accelerating. Regenerative braking system provided).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Suzuki in view of Guimarin and Hammerslag system so that Parise system so that the charge within the vehicle may be easily conserved.

Response to Arguments

5. Applicant's arguments filed 3/14/11 have been fully considered but they are not persuasive. **Regarding claim 1,** the applicant argues that the Suzuki, Guimarin and Hammerslag reference do not teach the loading and unloading apparatus is equipped with a loading and unloading control system. As disclosed above, Suzuki does not disclose the loading and unloading control system but teaches this system with the control system disclosed in figure 6, the battery management unit and paragraph [0084] - [0086]. Guimarin teaches a loading and unloading control system which intercommunicates with the bus mounted system in column 12 lines 57 - column 13 line

29 wherein the system communicates with the vehicle to determine the type of vehicle and battery used. Hammerslag provides a system wherein information is communicated between the vehicle and the battery exchange system to determine the battery and charge status and determines location of vehicle. The applicant argues that the Guimarin system and the Hammerslag system do not teach "when the loading and unloading control system recieves a signal sent from the bus-mounted control system of the bus of when the bus will return to the charge status and the predetermined position corresponding to the bus at the charge station and waits. Hammerslag discloses in column 4 lines 75 - 67 wherein signals are exchanged between the system and the vehicle. The applicant argues that the centralized system does not receive a signal from the bus mounted control system will return to the charge station. The centralized system monitors the last charging system and the location of the battery within the vehicle which can determine when the battery will return the station. Parise, Guimarin, Suzuki and Hammerslag are analogous art because they pertain to charging and recharging vehicle batteries at a station.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexis Boateng whose telephone number is (571) 272-5979. The examiner can normally be reached on 8:30 am - 6:00 pm, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Koval Melissa can be reached on (571) 272-2121. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Edward Tso/
Primary Examiner, Art Unit 2858

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